ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

10. Partial Differential Equations

1991 MS Classification: 35
Koch, Herbert, Universität Heidelberg
Large time regularity of solutions to the porous medium equation
We consider the porous medium equation

$$\rho_t = \Delta \rho^m$$

with $m > 1$. It is well known that solutions which have compact support initially are compactly supported for all times. We prove that locally nondegenerate solutions have a smooth pressure up to the boundary of the support. Moreover the boundary of the support is smooth for those solutions. All solutions under some weak restrictions on the initial data are nondegenerate for large times and hence smooth. The proof relies on modified Gaussian estimates for the fundamental solution of a linear degenerate parabolic (subelliptic) equation with measurable coefficients.